

Experiments for ascertaining the Velocity of Sound, at Madras in the East Indies. By John Goldingham, Esq. F.R.S. Read February 20, 1823. [*Phil. Trans.* 1823, p. 96.]

The author commences this paper with an abstract of the opinions, experiments, and calculations of several eminent philosophers who have studied the above subject; and after remarking upon their discordant results, observes that his own experiments may perhaps furnish a clue for discovering the cause of such differences. These were made at Fort St. George, where a morning and evening gun are fired from the ramparts, the former at daylight, and the latter at 8 o'clock in the evening. Morning and evening guns are also fired at St. Thomas's Mount; and between these the Madras Observatory is situated, in latitude $13^{\circ} 4' 8''$ N., at which the observations were made with chronometers of 100 beats in 40 seconds. Each observer began to count the beats in the interval of the flash and report. Their number was registered, as well as the height of the thermometer, barometer, and hygrometer, and the state of the wind and weather at the time. The distances of the guns from the observatory were ascertained with much precision; that of the Mount gun being 29547 feet, and of the Fort gun 13932.3 feet. The results of these experiments are given in eleven annexed tables. From Tables 1 and 6, it appears that the velocity of sound is much affected by different states of the atmosphere and weather; and from Tables 2 and 7, we find as the thermometer rose, the atmosphere at the same time decreasing in density, sound moved with increased rapidity. The mean velocity of sound deduced from these experiments appears to be 1142 feet in a second, which closely corresponds with the estimate of Newton and Halley. The comparison of the experiments with the Mount and Fort guns seems to show that sound travels equally in its progress; and by comparing the observations upon the influence of wind, a difference is found of 1275 feet in a minute between the wind being in the direction of the motion of the sound, and opposed to it.

On the Double Organs of Generation of the Lamprey, the Conger Eel, the common Eel, the Barnacle, and Earth Worm, which impregnate themselves; though the last from copulating, appear mutually to impregnate one another. By Sir Everard Home, Bart. V.P.R.S. Read February 27, 1823. [*Phil. Trans.* 1823, p. 140.]

Having previously ascertained the teredo and the lamprey to be hermaphrodites, and that in these tribes the same individual both forms and impregnates the ova, the author shows upon the present occasion, that eels and barnacles are similar in their mode of generation. In respect to the former, the author adopts the opinion of Sir Humphry Davy, that the common and the conger eel belong to the same species, their difference in size and colour depending upon the one living in fresh and the other in salt water. Their organs of